81

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## Experimentally evaluating the function of self-directed behaviour in two adult mandrills (Mandrillus sphinx)

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## Abstract

Given the difficulties of conducting regular endocrine and veterinary assessments of animals, behavioural observations are often the most commonly used tool to assess the welfare of animals in human care. Behavioural measures, inexpensive and convenient to collect, also have their challenges, such as ensuring the behaviours of interest are reliable indicators of an animal's internal state. Welfare assessments include both positive and negative indicators, and a commonly used indicator of negative welfare is self-directed behaviour (SDB). SDB has been described as a behavioural indicator of stress through observation and experimentation; however, this pattern is not universal despite assumptions otherwise. The purpose of this study was to experimentally evaluate the use of SDB as an indicator of negative welfare in mandrills (Mandrillus sphinx) with the goal of understanding the function of SDB in relation to stress. Using a touchscreen-mediated cognitive task, the mandrills were observed to self-scratch significantly more often during incorrect than correct trials; however, rates of SDB did not vary between increasingly difficult testing conditions. The mandrills had individual variation in their use of body-shakes and yawns under negative and positive conditions that mirror similar variation observed in other primates. This study provides experimental evidence that self-scratching in mandrills can be used as a behavioural indicator of anxiety and that welfare assessments for animals in human care need to account not only for species' differences, but also for individual differences.

Keywords: animal behaviour, animal welfare, mandrill, primate cognition, self-directed behaviour, zoo